Fig.1A

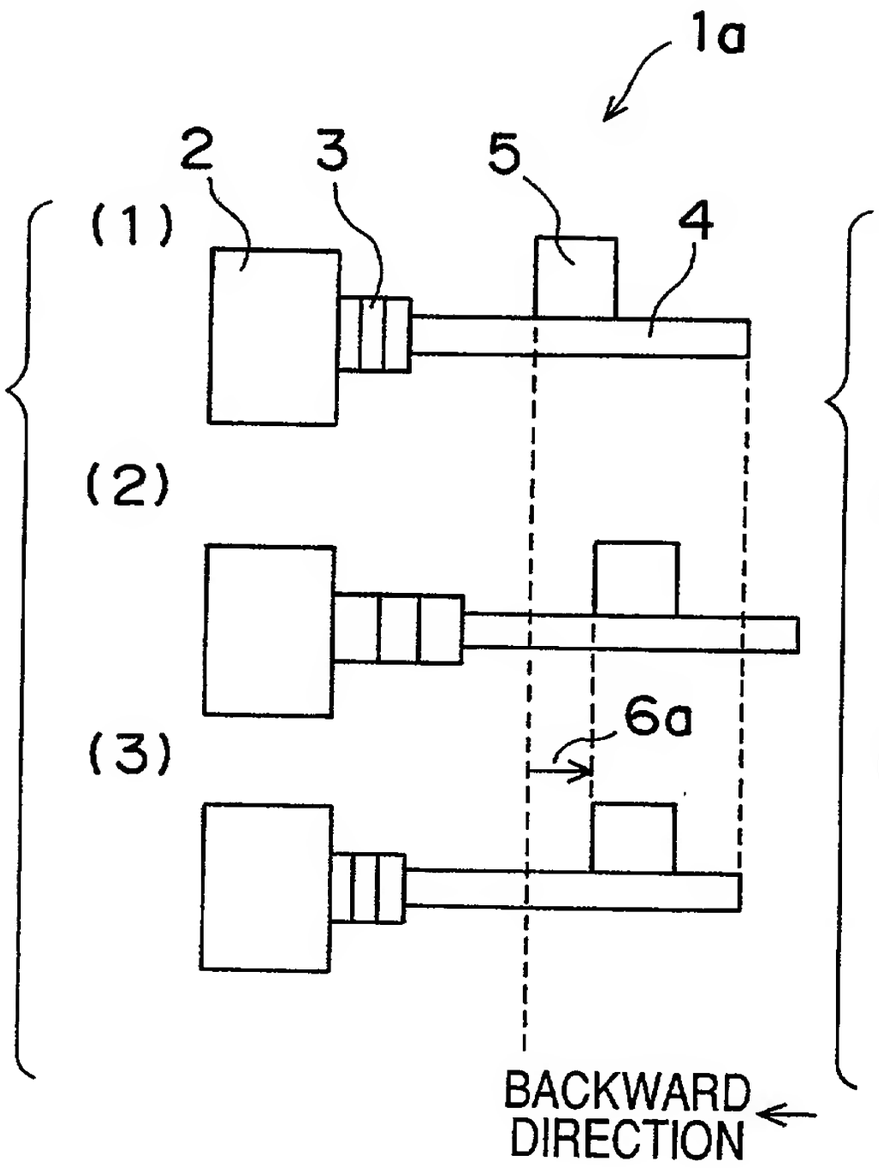


Fig.1B

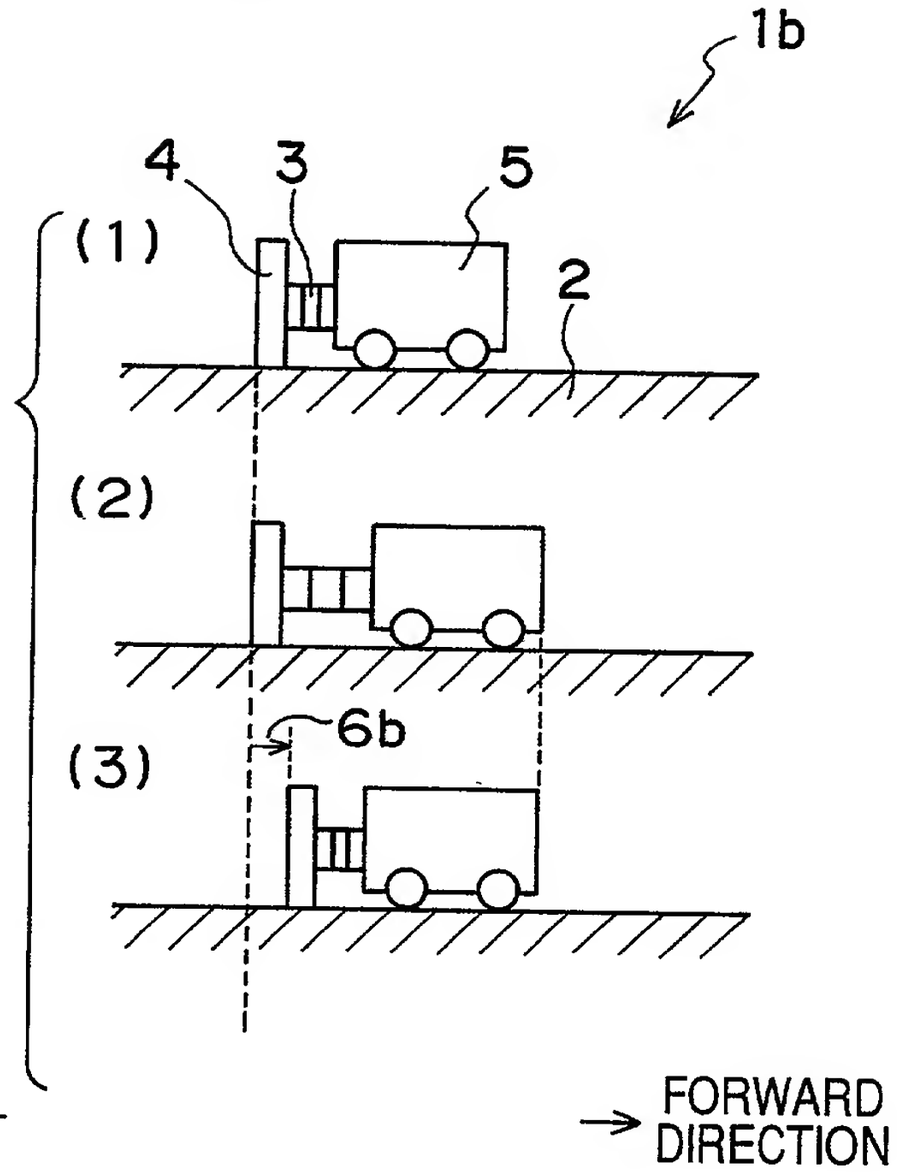


Fig.1C

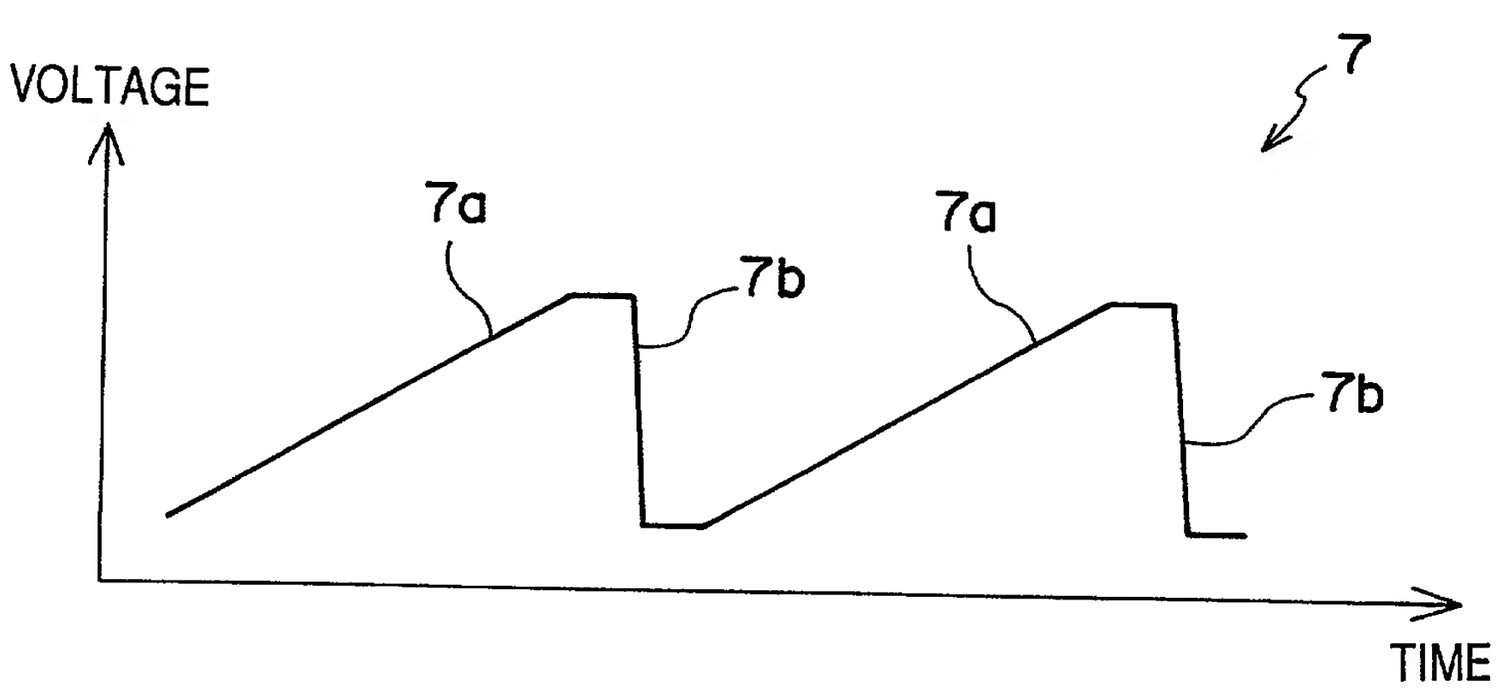


Fig.2A

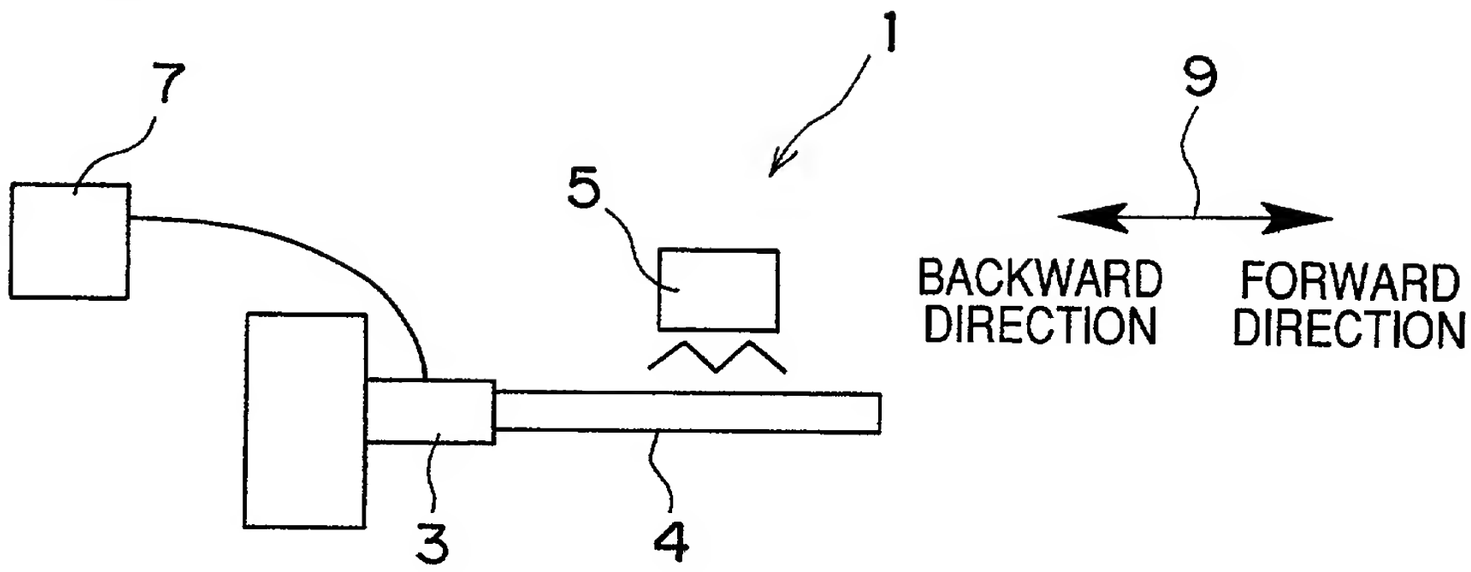


Fig.2B

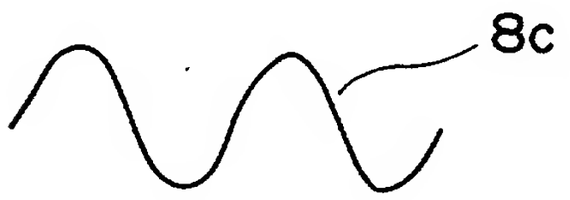
MOTION OF DRIVE ROD	ADVANTAGEOUS EFFECT
	MOVING BODY MOVES FORWARD
	MOVING BODY MOVES BACKWARD
	FRICTION REDUCES

Fig.3A

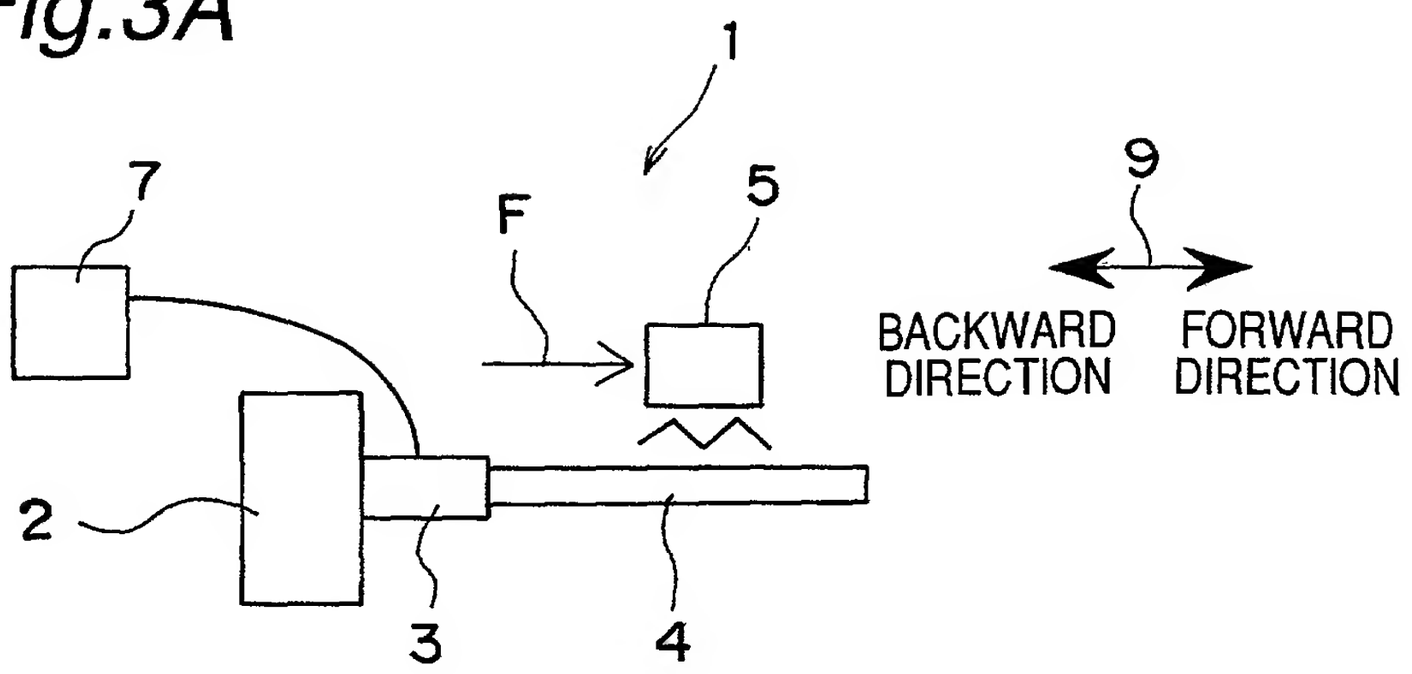

1
7
F
5
9
BACKWARD DIRECTION
FORWARD DIRECTION
2
3
4

Fig.3B

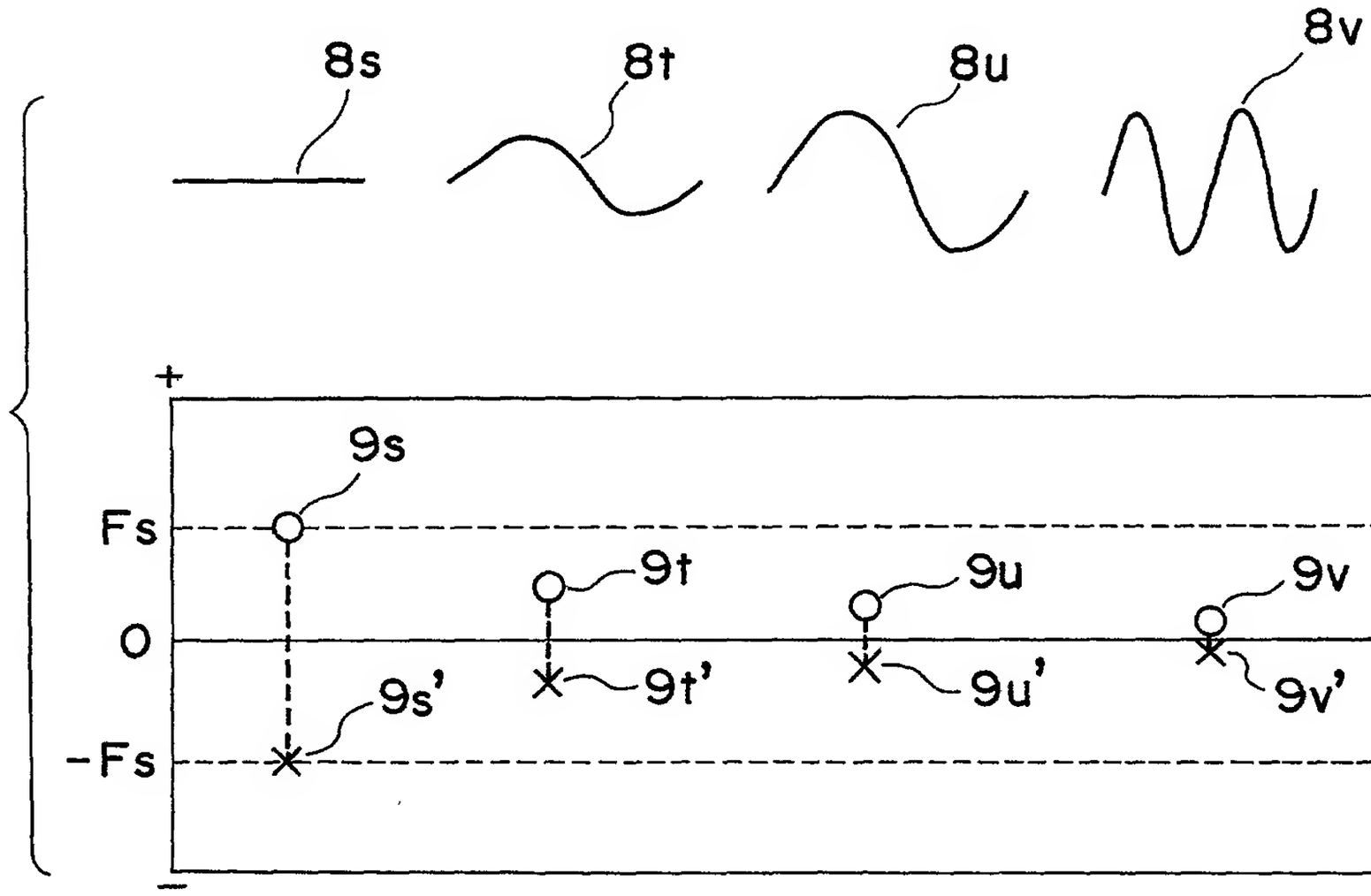

8s
8t
8u
8v
+
9s
Fs
9t
9u
9v
0
9s'
9t'
9u'
9v'
-Fs
−

Fig.4A

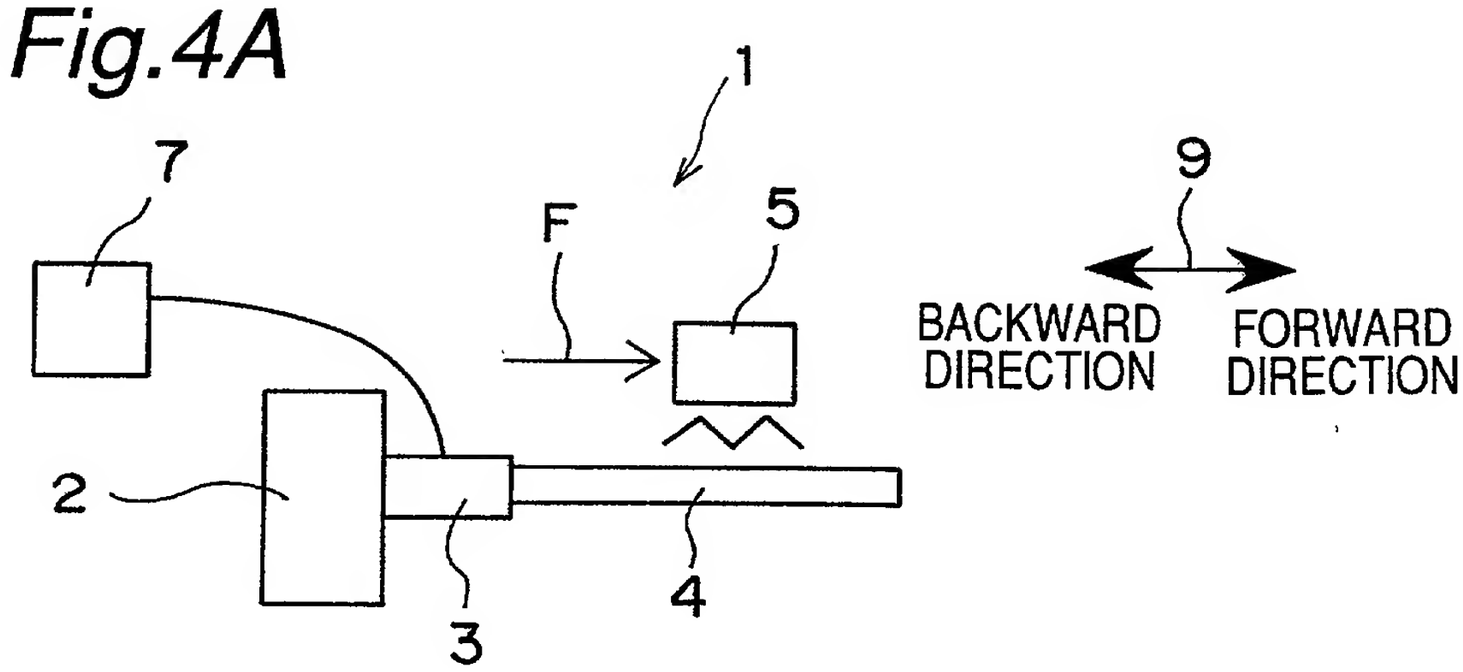
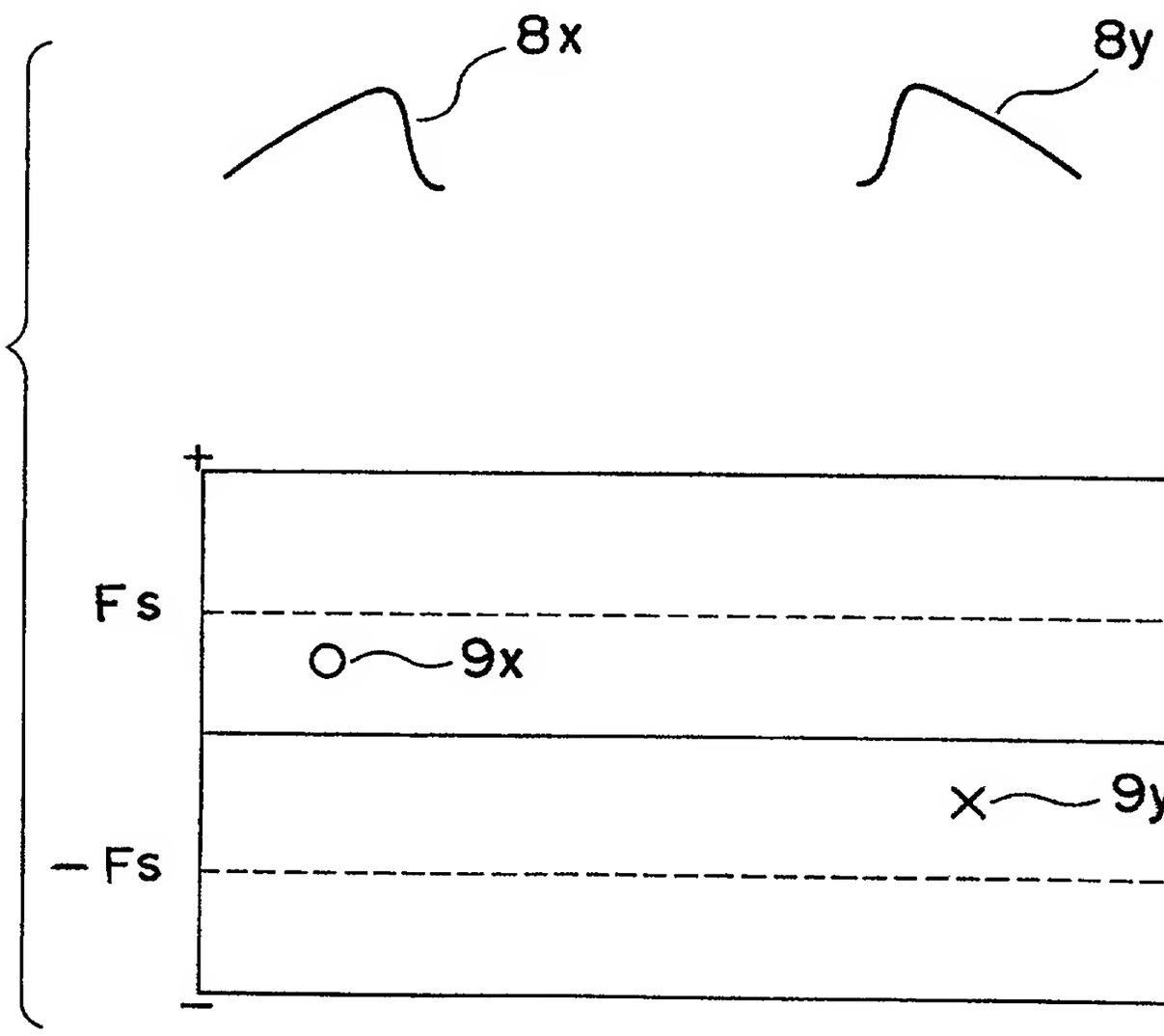

1
7
F
5
9
BACKWARD DIRECTION
FORWARD DIRECTION
2
3
4

Fig.4B


8x
8y
+
Fs
O~9x
X~9y'
-Fs
-

2002-98ES007

Fig.5

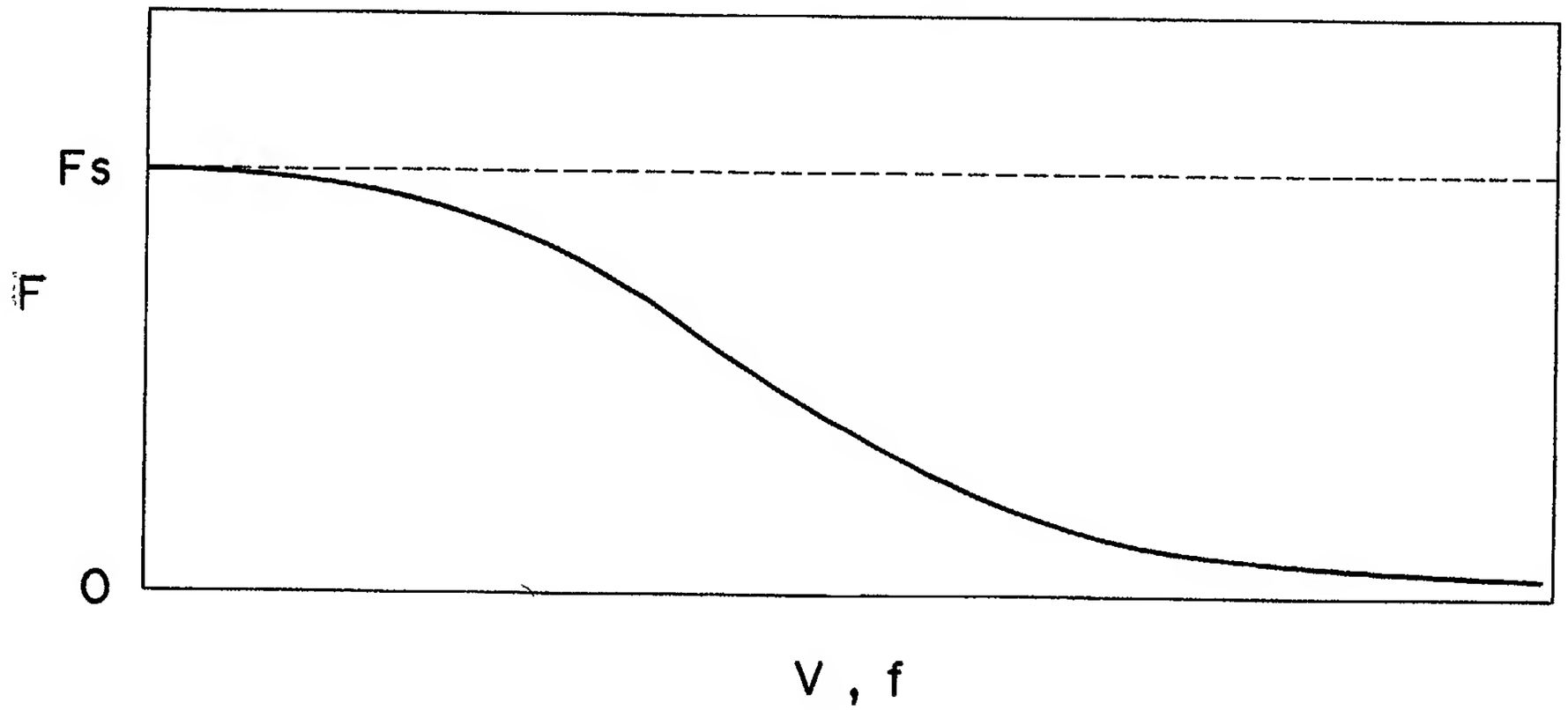


Fig.6

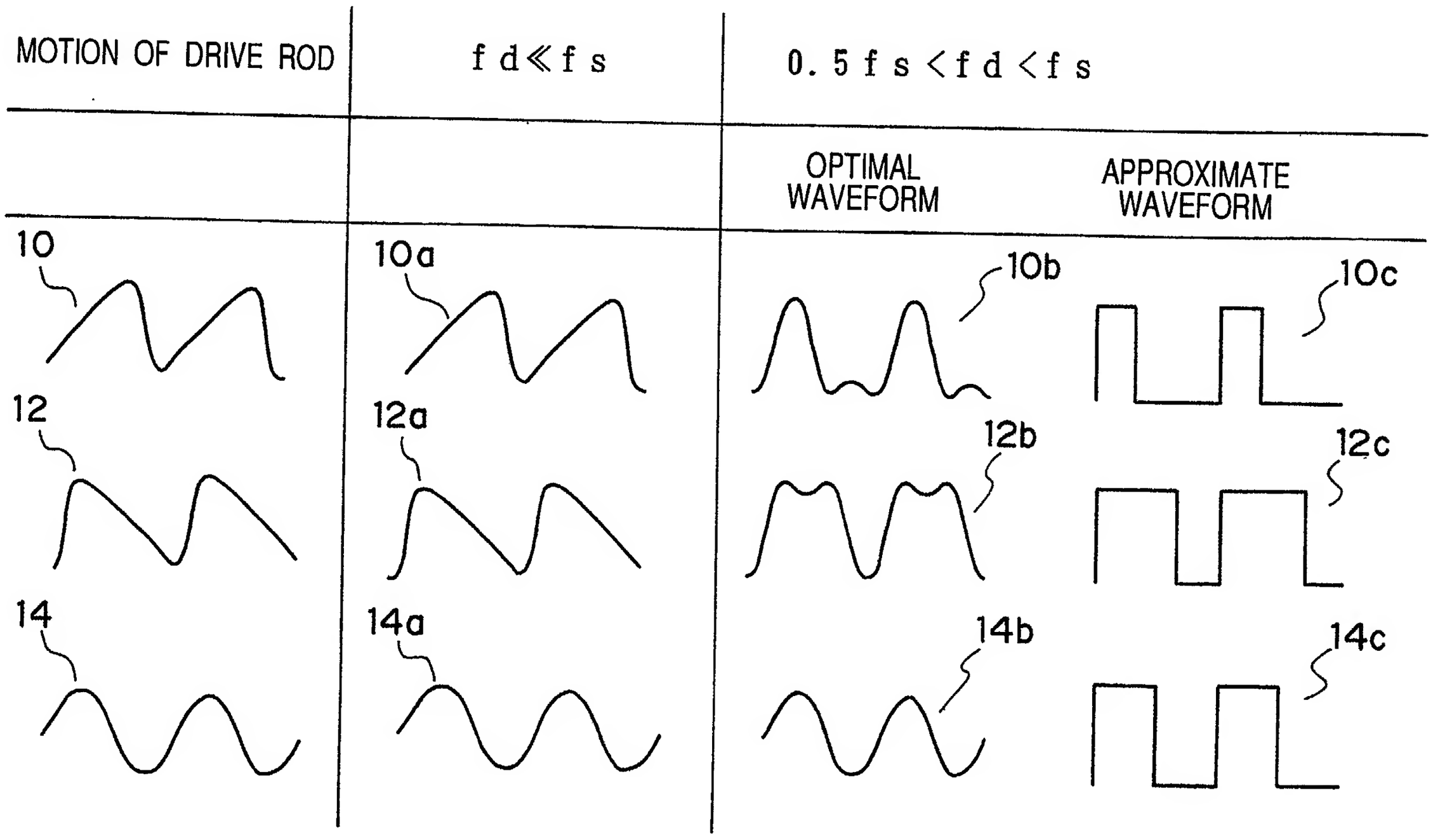


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Fig.7A

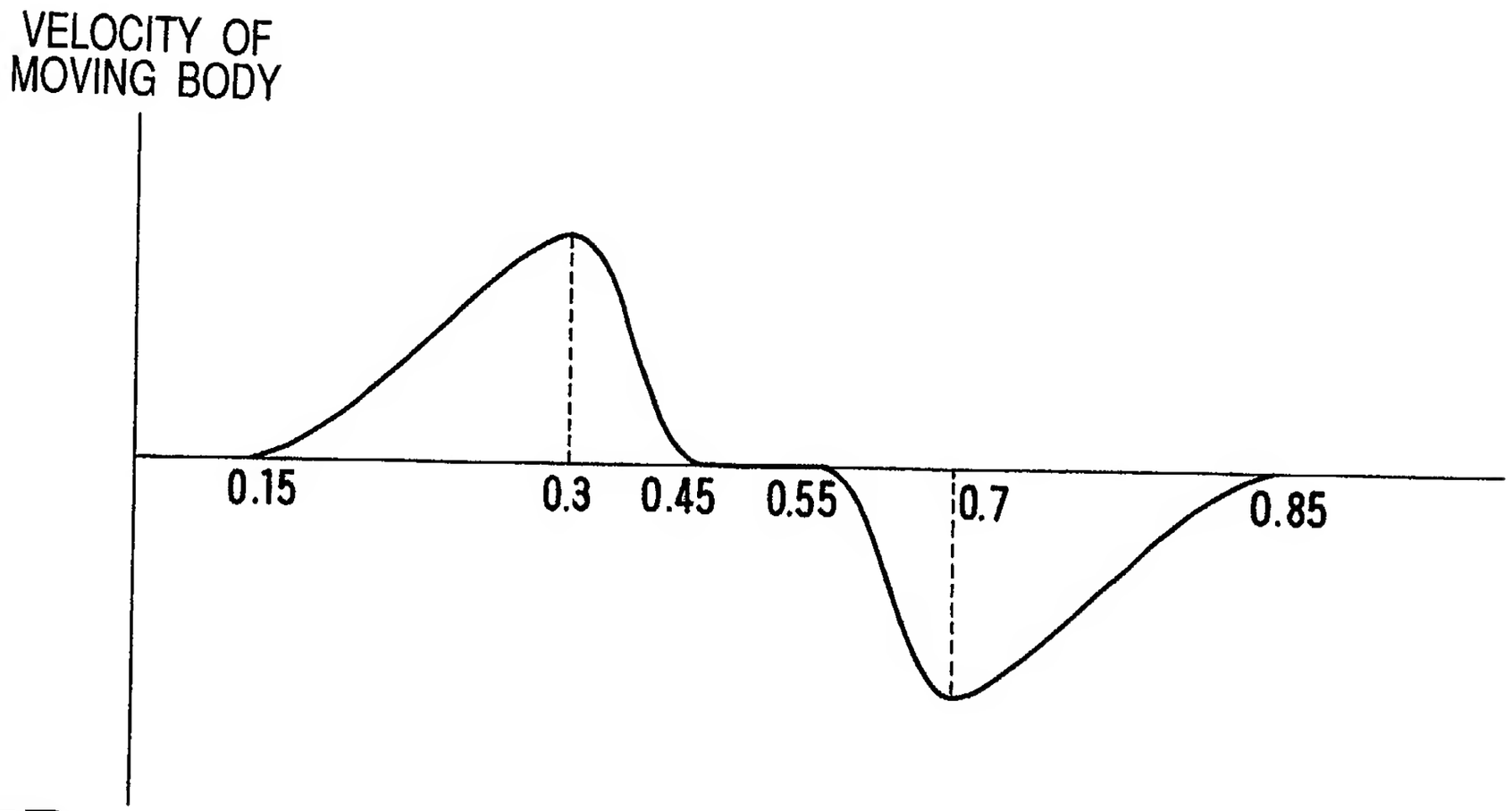

Fig.7B

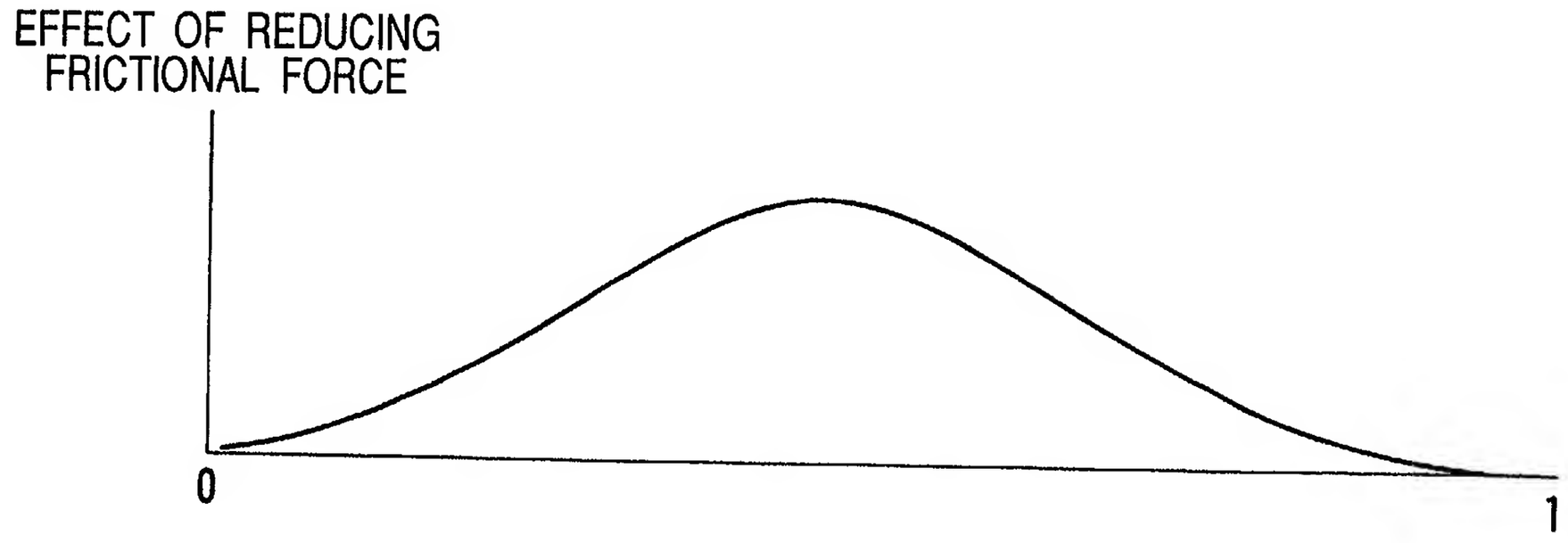

Fig.8A

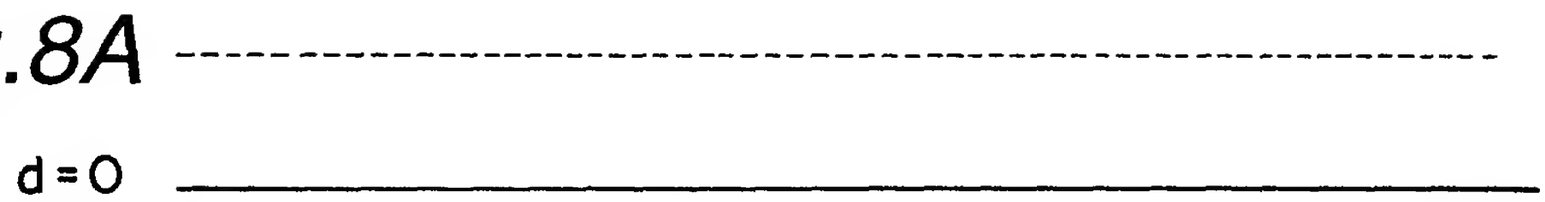

Fig.8B

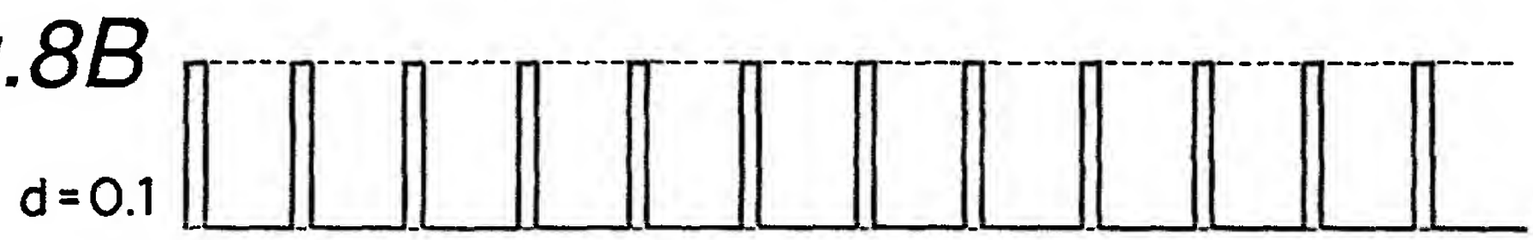

Fig.8C

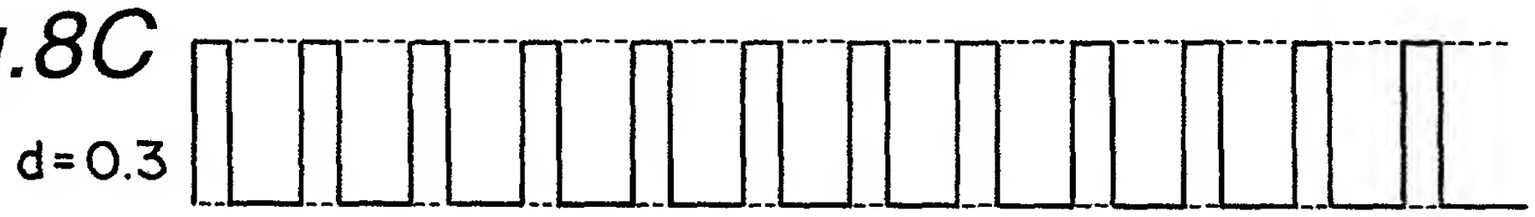

Fig.8D

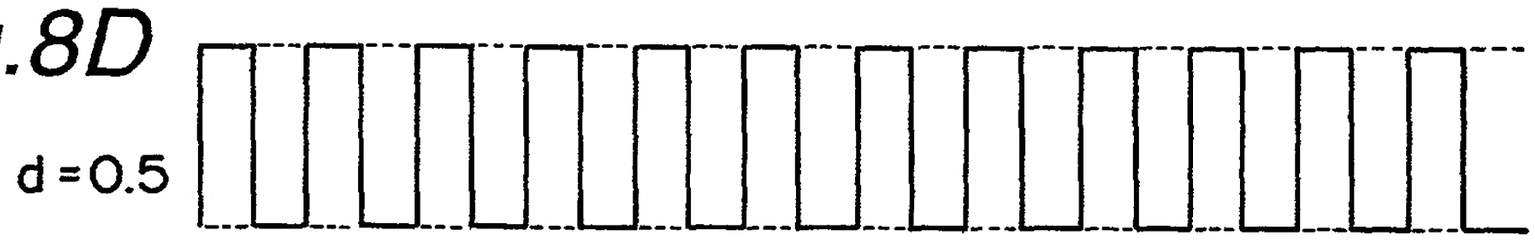

Fig.8E

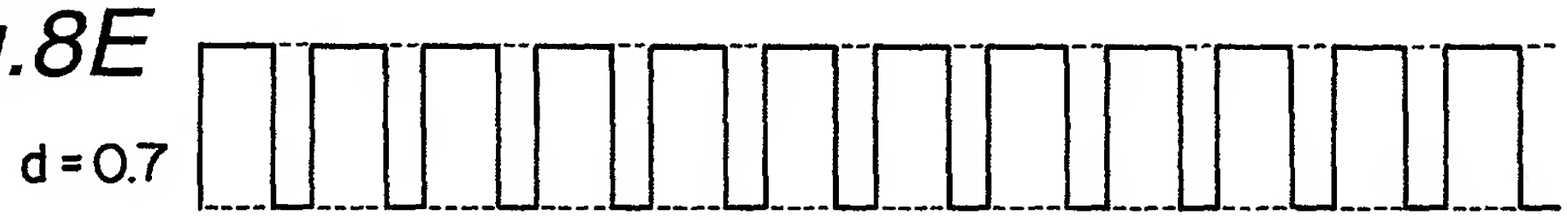

Fig.8F

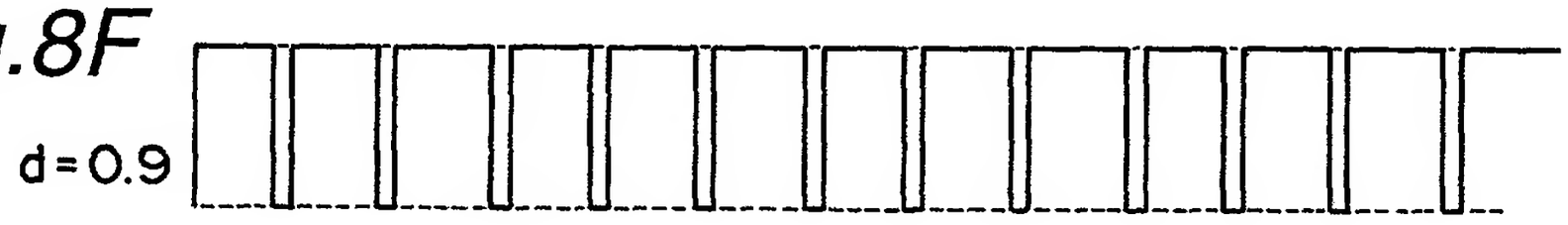

Fig.8G

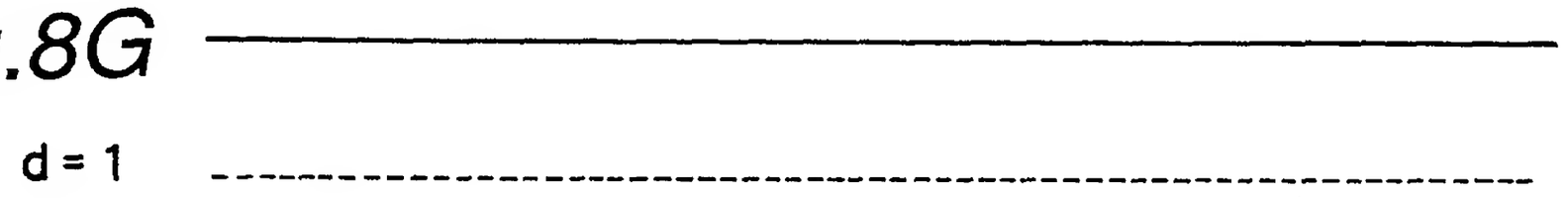

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Fig.9A

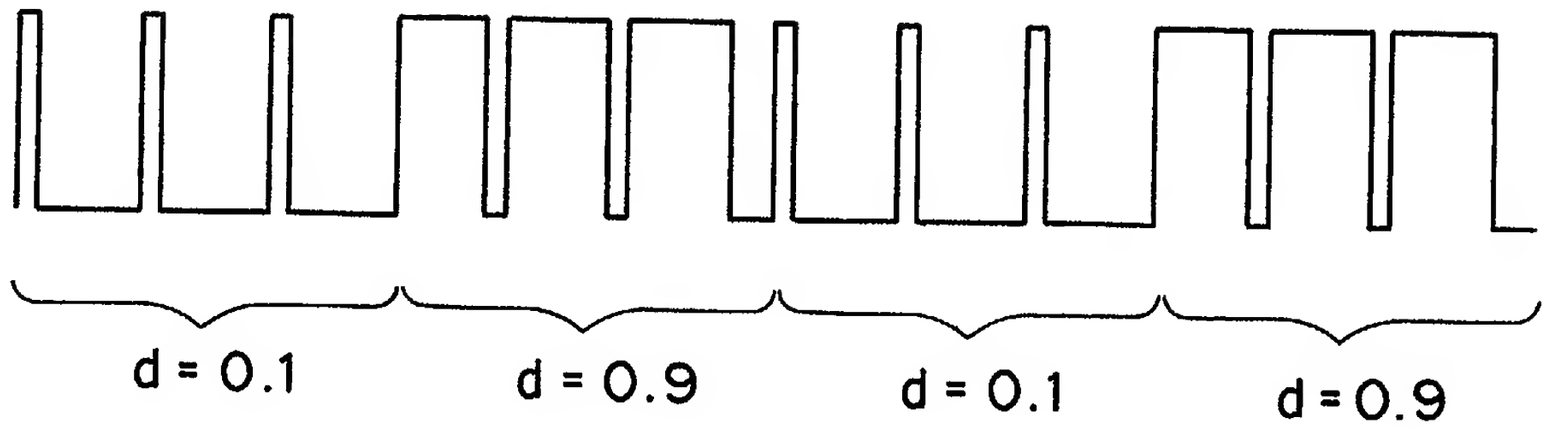

Fig.9B

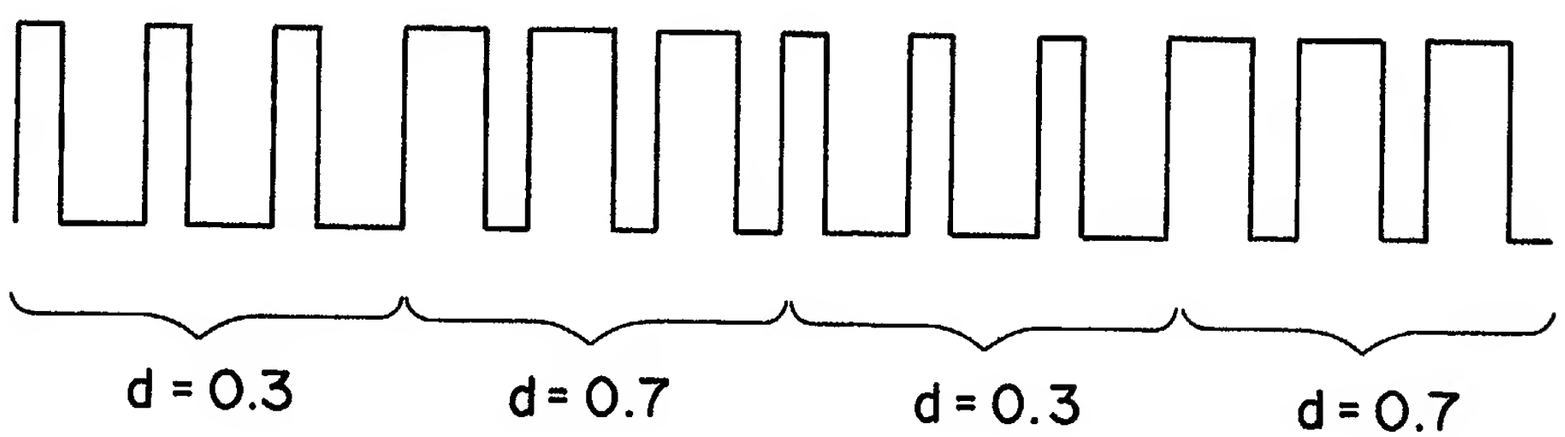

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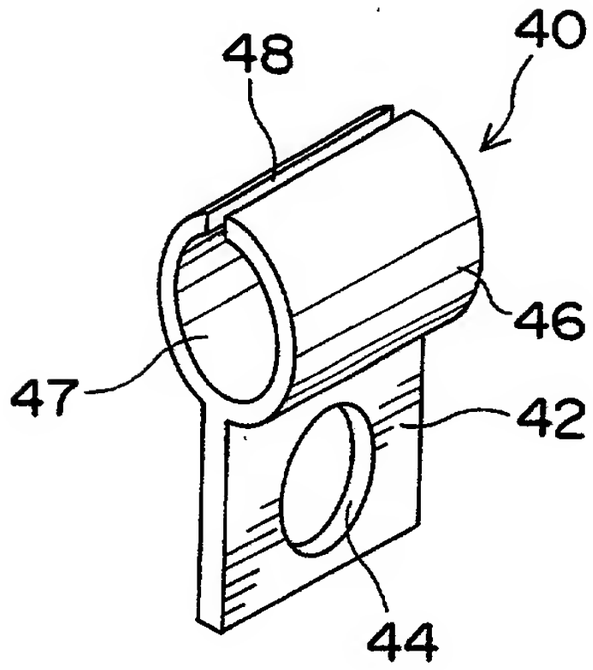
Fig.10A



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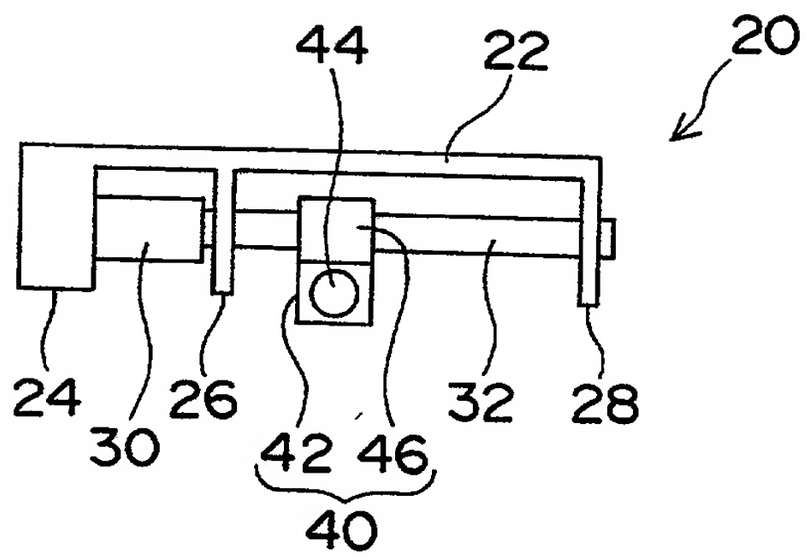


Fig.10C

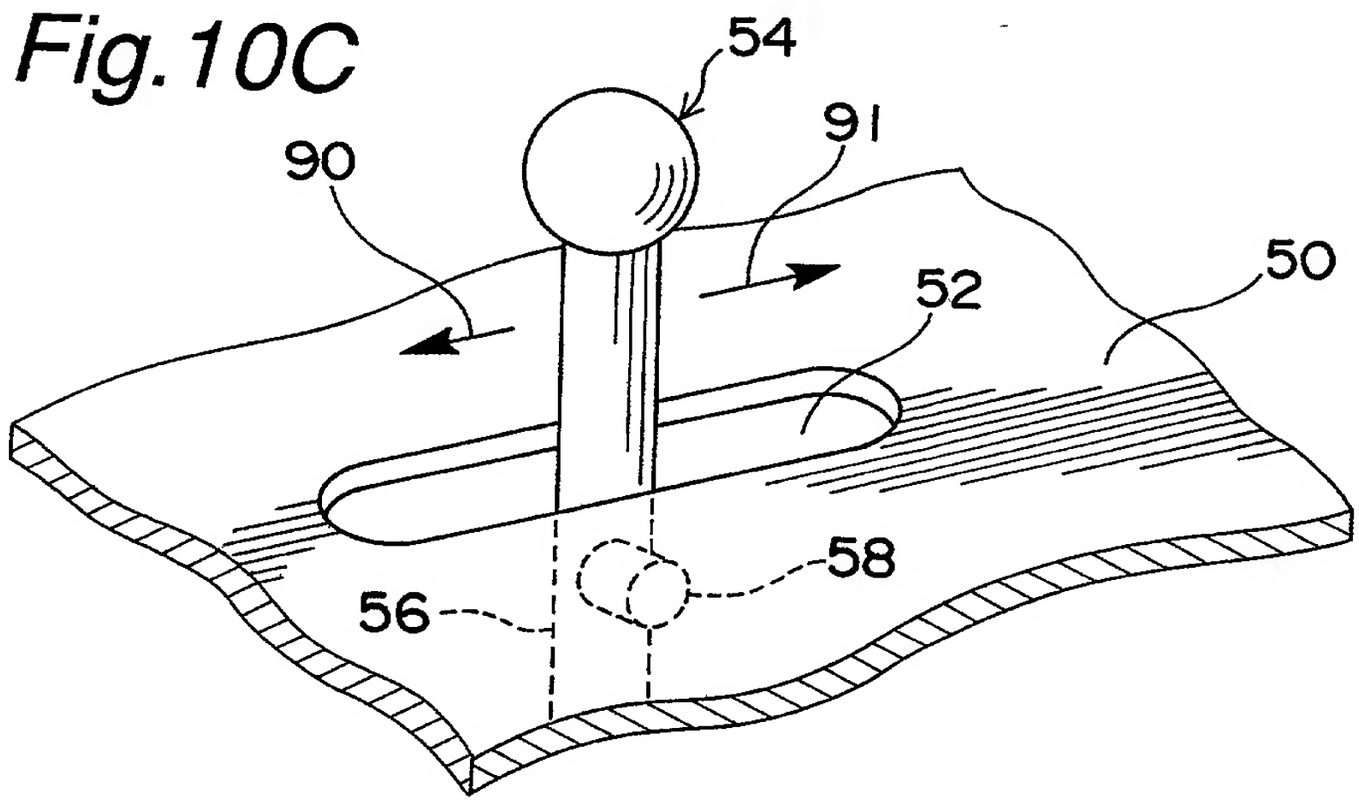


Fig.10D

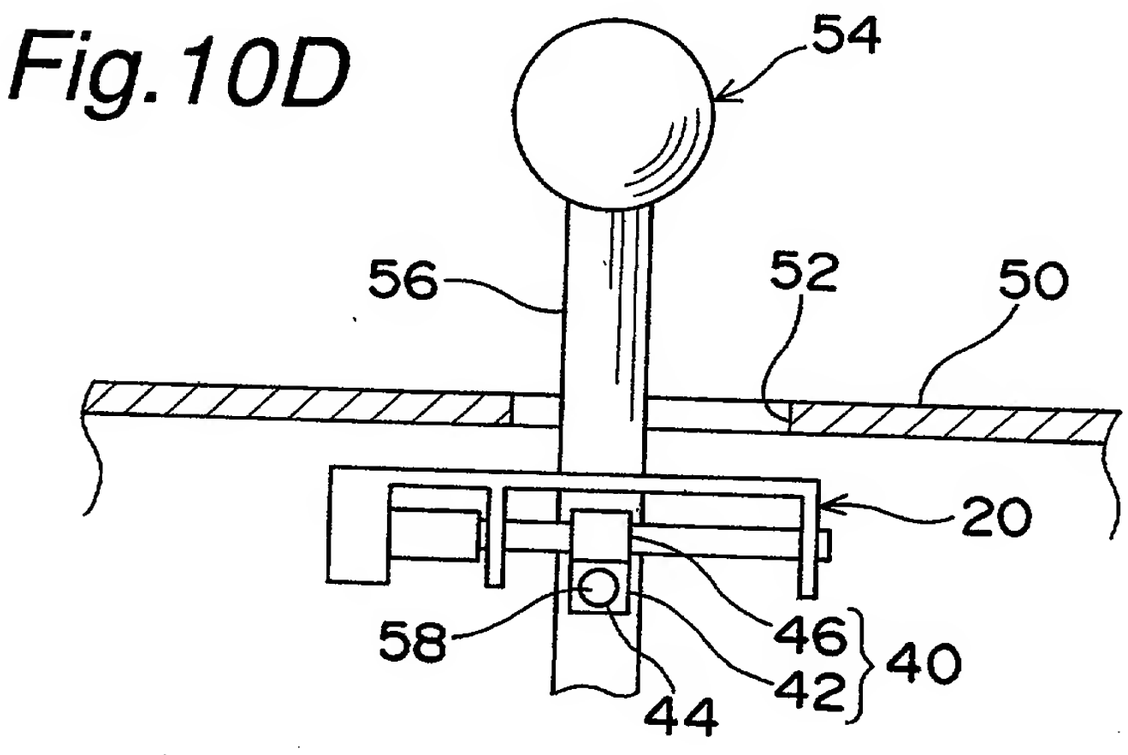
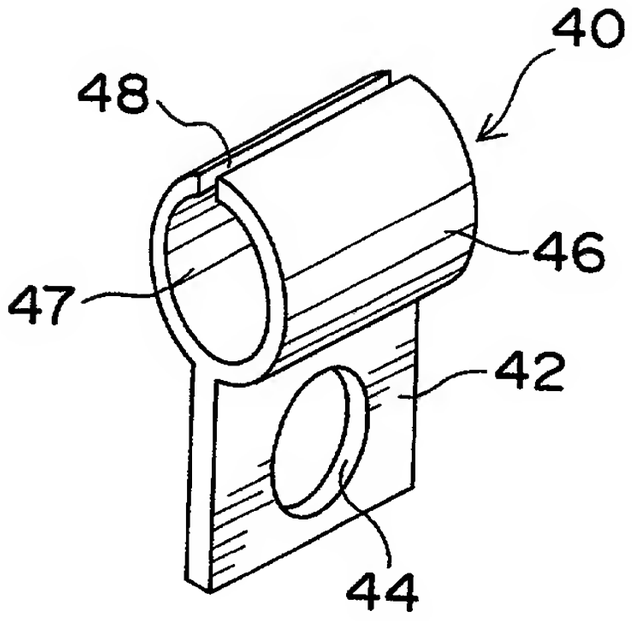


Fig.11A



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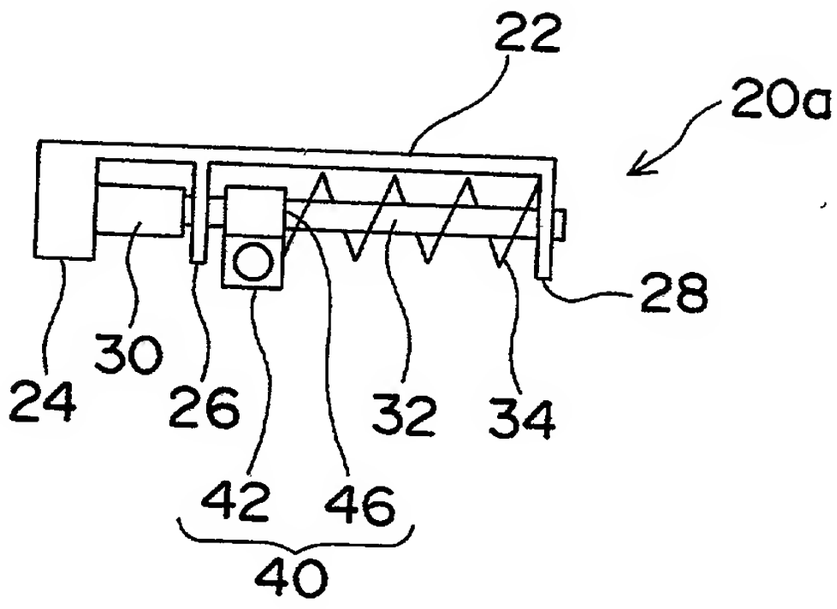

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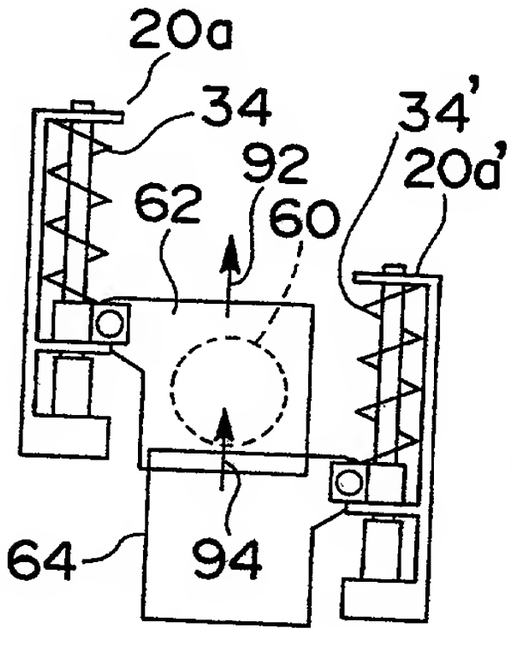

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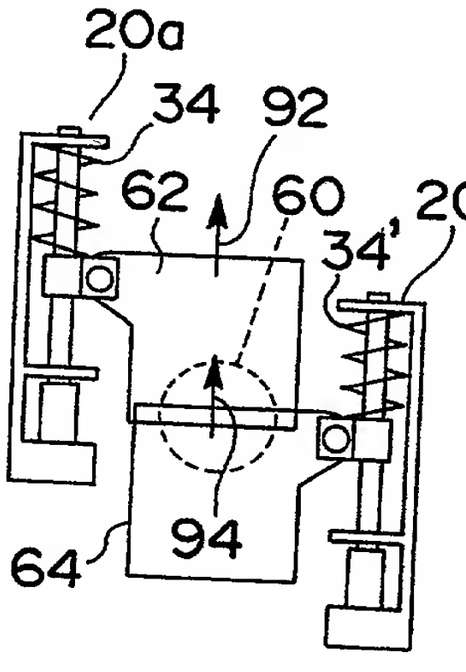

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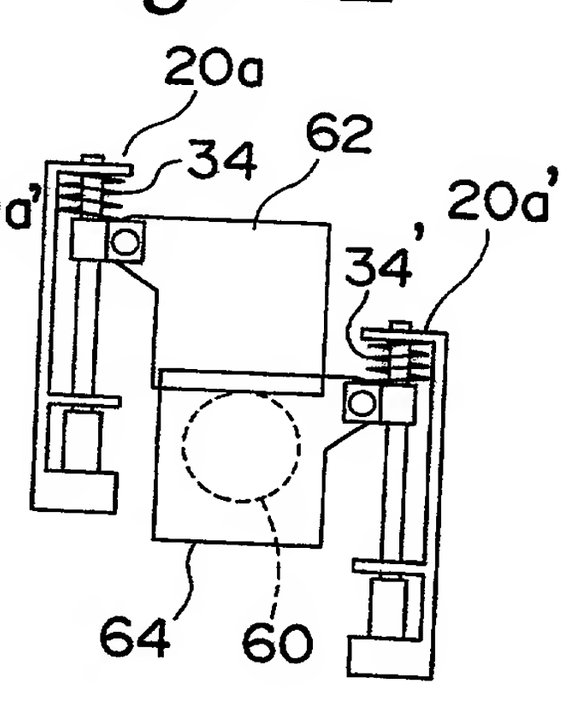

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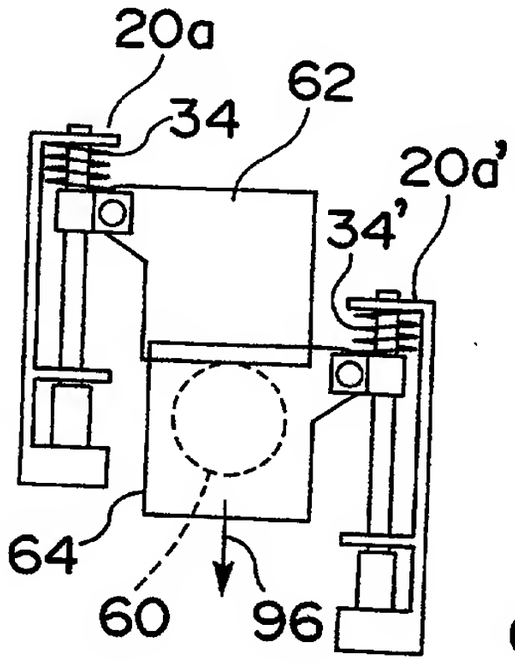

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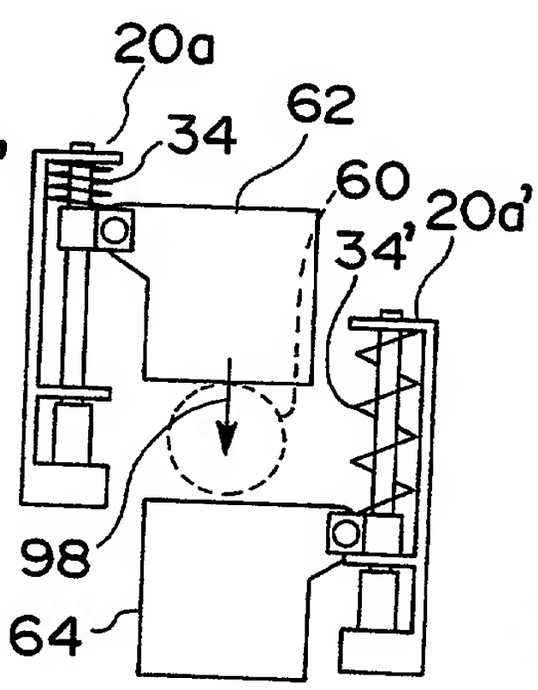
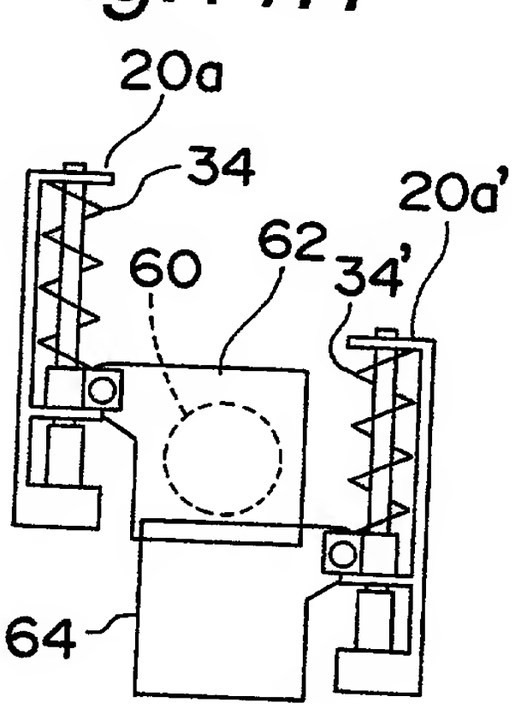
Fig.11H